Storm Data and Unusual Weather Phenomena

December 2000

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Number of Persons Injured	Estimated Damage Property	Estimated Damage Crops	Character of Storm
INDIANA, Northeast									
INZ003>008-012-014-016	**La Porte - St. Joseph - Elkhart - Lagrange - Steuben - Noble - Starke - Marshall - Kosciusko**								
	11	**0800EST**			**0**	**0**	**0**		**Heavy Snow**
	12	**1000EST**							

...Synoptic and mesoscale conditions on December 11th...
An unseasonably cold arctic airmass spilling southward out of southern Canada on the 10th combined with a very strong upper level disturbance and upper level jet of 160 knots came together over the Midwest early on the 11th. Surface low pressure developed over Oklahoma early on the 11th and rapidly deepened as it lifted northeastward into central Indiana by late afternoon. Heavy snow developed quickly during the morning and mixed with some sleet at times due to the tremendous warm air advection out ahead of the intensifing system. Heavy snow continued into the early morning hours of the 12th with thunder snow reported at several locations in northwest Indiana and southwest Michigan within the mid level deformation zone of the upper low. As the surface low continued to intensify and pull out into Ohio during the night of the 11th...strong gradient winds developed creating near blizzard conditions over northwest Indiana and southwest Michigan and caused some damage to trees and power lines over northwest Ohio with wind gusts of 59 mph reported in Putnam Ohio and 56 mph in Lima Ohio. Some notable storm total snowfall reports included 16 inches in Cassopolis... 14 in Elkhart... 13.5 in Goshen... 12 in Niles, St. Joseph, Salem Center, and the South Bend airport... and 10 inches in Berrien Springs, Westville, Middlebury, Mishawaka, Union, and White Pigeon with 6 to 8 inches elsewhere.

INZ017>018-020-022>027-032>034	**Whitley - Allen - White - Cass - Miami - Wabash - Huntington - Wells - Adams - Grant - Blackford - Jay**								
	13	**1200EST**			**0**	**0**	**0**		**Heavy Snow**
	14	**0000EST**							

...Synoptic and mesoscale conditions for December 13th...
Another in a series of strong upper level disturbances coming out of the southern plains combined with an intensifing upper jet over southern Canada led to another bout of heavy snow across part of Indiana and Northwest Ohio on the 13th. Although the surface low remained quite weak and the upper level system moved rather quickly... moisture was able to quickly advect northward out of the lower Mississippi valley as the low level jet intensified in response to increasing upper level divergence associated with the strong upper level jet over southern Canada. Snow developed around noon and quickly became heavy by mid afternoon and continued into late evening before tapering off. Some notable storm total snowfall reports included 8 inches at Grissom AFB... 7.4 in Young America... 7 in Defiance, Huntington, Monroeville, Portland, Bluffton, and Montpelier, and 6 in Marion, Columbus Grove, Fort Wayne, Hartford City, Monticello, Van Wert, Wabash, Wauseon, and Columbia City.

INZ006>008-015>018-022>024	**Lagrange - Steuben - Noble - Fulton - Kosciusko - Whitley - Allen - Cass - Miami - Wabash**								
	16	**2300EST**			**0**	**0**	**0**		**Heavy Snow**
	17	**0700EST**							

...Synoptic and mesoscale conditions on December 17th...
The last in a series of strong upper level disturbances and associated upper level jet streaks moving northward out of the lower Mississippi valley combined with another arctic cold front dropping down out of southern Canada on the 17th. Developing surface low pressure along the advancing arctic front was initially quite weak...however as the strong upper level low ejected out of the mean long wave trough through the central US and two distinct upper jet streaks coupled...the surface low bombed as it moved northeast from Louisville Kentucky to Toledo Ohio late that evening. Very heavy snow developed within the developing mid level deformation zone due in part to considerable moisture wrapping westward in advance of the upper level low, increasing deep upward vertical motion as the jet streak coupling occurred and rapid intensification of the system in general. Several locations reported thunder snow with snowfall rates of 1 to 2 inches per hour for a 6 hour period during the early morning hours of the 17th. Some notable storm total snowfall reports included 10.5 inches in Lagrange... 9 in Sturgis and Albion, 8 in Warsaw and La Otto, 7 in Columbia City, Cromwell, Kendallville and Middlebury and 6 inches in Rochester, Royal Center, Logansport and Fort Wayne.

INZ003>006-008-012-014-016	**La Porte - St. Joseph - Elkhart - Lagrange - Noble - Starke - Marshall - Kosciusko**								
	18	**1200EST**			**0**	**0**	**0**		**Heavy Snow**
	19	**0000EST**							

...Synoptic and mesoscale conditions for December 18th and 19th...
A strong upper jet streak combined with an intense mid-level shortwave trough were responsible for developing low pressure over southern Missouri the morning of the 18th. Heavy snow broke out across Iowa and Illinois early in the afternoon of the 18th. As the system strengthened and moved northeast...moderate to heavy developed over northern Indiana and southwest lower Michigan which continued into late evening.
As the low pulled off into Ontario Canada...strong northwest winds advecting in much colder air began to stream down along the long stream axis of Lake Michigan with multiple bands of lake effect snow developing the morning of the 19th. Due to the large temperature differences between the lake and 850 millibars and the development of a mesoscale low over the lake...an intense shore parallel lake effect snow band developed by late morning on the 19th. This band shifted slowly eastward during the day of the 19th

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INDIANA, Northeast

dropping 1 to 2 inches of snow per hour before it broke up and dissipated by late evening. General snowfall amounts with the synoptic system ranged from 2 to 5 inches with an additional 1 to as much as 8 inches of lake effect snow. Notable combined storm total snowfall amounts included 13 inches at Bridgman Michigan... 10 in Michigan City, Kingsbury, Elkhart and St. Joseph... 9 in Plymouth, LaPorte and Benton Harbor... 8 in Goshen and Cassopolis... 6 to 7 in Nappanee, South Bend, Warsaw, Middlebury, Mishawaka, Union and White Pigeon.

MICHIGAN, Extreme Southwest

MIZ077>081 **Berrien - Cass - St. Joseph - Branch - Hillsdale**

11	**0800EST**	**0**	**0**	**0**	**Heavy Snow**
12	**1400EST**				

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An unseasonably cold arctic airmass spilling southward out of southern Canada on the 10th combined with a very strong upper level disturbance and upper level jet of 160 knots came together over the Midwest early on the 11th. Surface low pressure developed over Oklahoma early on the 11th and rapidly deepened as it lifted northeastward into central Indiana by late afternoon. Heavy snow developed quickly during the morning and mixed with some sleet at times due to the tremendous warm air advection out ahead of the intensifing system. Heavy snow continued into the early morning hours of the 12th with thunder snow reported at several locations in northwest Indiana and southwest Michigan within the mid level deformation zone of the upper low. As the surface low continued to intensify and pull out into Ohio during the night of the 11th...strong gradient winds developed creating near blizzard conditions over northwest Indiana and southwest Michigan and caused some damage to trees and power lines over northwest Ohio with wind gusts of 59 mph reported in Putnam Ohio and 56 mph in Lima Ohio. Some notable storm total snowfall reports included 16 inches in Cassopolis... 14 in Elkhart... 13.5 in Goshen... 12 in Niles, St. Joseph, Salem Center, and the South Bend airport... and 10 inches in Berrien Springs, Westville, Middlebury, Mishawaka, Union, and White Pigeon.

MIZ079>080 **St. Joseph - Branch**

17	**0000EST**	**0**	**0**	**0**	**Heavy Snow**
	0600EST				

...Synoptic and mesoscale conditions on December 17th...
The last in a series of strong upper level disturbances and associated upper level jet streaks moving northward out of the lower Mississippi valley combined with another arctic cold front dropping down out of southern Canada on the 17th. Developing surface low pressure along the advancing arctic front was initially quite weak...however as the strong upper level low ejected out of the mean long wave trough through the central US and two distinct upper jet streaks coupled...the surface low bombed as it moved northeast from Louisville Kentucky to Toledo Ohio late that evening. Very heavy snow developed within the developing mid level deformation zone due in part to considerable moisture wrapping westward in advance of the upper level low, increasing deep upward vertical motion as the jet streak coupling occurred and rapid intensification of the system in general. Several locations reported thunder snow with snowfall rates of 1 to 2 inches per hour for a 6 hour period during the early morning hours of the 17th. Some notable storm total snowfall reports included 10.5 inches in Lagrange... 9 in Sturgis and Albion, 8 in Warsaw and La Otto, 7 in Columbia City, Cromwell, Kendallville and Middlebury and 6 inches in Rochester, Royal Center, Logansport and Fort Wayne.

MIZ077>079 **Berrien - Cass - St. Joseph**

18	**1200EST**	**0**	**0**	**0**	**Heavy Snow**
19	**0000EST**				

...Synoptic and mesoscale conditions for December 18th and 19th...
A strong upper jet streak combined with an intense mid-level shortwave trough were responsible for developing low pressure over southern Missouri the morning of the 18th. Heavy snow broke out across Iowa and Illinois early in the afternoon of the 18th. As the system strengthened and moved northeast...moderate to heavy developed over northern Indiana and southwest lower Michigan which continued into late evening.
As the low pulled off into Ontario Canada...strong northwest winds advecting in much colder air began to stream down along the long stream axis of Lake Michigan with multiple bands of lake effect snow developing the morning of the 19th. Due to the large temperature differences between the lake and 850 millibars and the development of a mesoscale low over the lake...an intense shore parallel lake effect snow band developed by late morning on the 19th. This band shifted slowly eastward during the day of the 19th dropping 1 to 2 inches of snow per hour before it broke up and dissipated by late evening. General snowfall amounts with the synoptic system ranged from 2 to 5 inches with an additional 1 to as much as 8 inches of lake effect snow. Notable combined storm total snowfall amounts included 13 inches at Bridgman Michigan... 10 in Michigan City, Kingsbury, Elkhart and St. Joseph... 9 in Plymouth, LaPorte and Benton Harbor... 8 in Goshen and Cassopolis... 6 to 7 in Nappanee, South Bend, Warsaw, Middlebury, Mishawaka, Union and White Pigeon.

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OHIO, Northwest									
OHZ015>016-024>025	**Paulding - Putnam - Van Wert - Allen**								
	11	**2200EST**			**0**	**0**	**0**		**High Wind (G51)[M]**
	12	**0200EST**							

...Synoptic and mesoscale conditions on December 11th and 12th...
An unseasonably cold arctic airmass spilling southward out of southern Canada on the 10th combined with a very strong upper level disturbance and upper level jet of 160 knots came together over the Midwest early on the 11th. Surface low pressure developed over Oklahoma early on the 11th and rapidly deepened as it lifted northeastward into central Indiana by late afternoon. A burst of heavy snow developed during the morning and quickly changed to heavy rain by late morning due to the tremendous warm air advection out ahead of the intensifing system. As the surface low continued to intensify and pull out into northern Ohio during the night of the 11th...strong gradient winds developed which caused some damage to trees and power lines over northwest Ohio with wind gusts of 59 mph reported in Putnam Ohio and 56 mph in Lima Ohio.

OHZ001>002-004>005-015>016-024>025	**Williams - Fulton - Defiance - Henry - Paulding - Putnam - Van Wert - Allen**								
	13	**1400EST**			**0**	**0**	**0**		**Heavy Snow**
	14	**0000EST**							

...Synoptic and mesoscale conditions for December 13th...
Another in a series of strong upper level disturbances coming out of the southern plains combined with an intensifing upper jet over southern Canada led to another bout of heavy snow across part of Indiana and Northwest Ohio on the 13th. Although the surface low remained quite weak and the upper level system moved rather quickly... moisture was able to quickly advect northward out of the lower Mississippi valley as the low level jet intensified in response to increasing upper level divergence associated with the strong upper level jet over southern Canada. Snow developed around noon and quickly became heavy by mid afternoon and continued into late evening before tapering off. Some notable storm total snowfall reports included 8 inches at Grissom AFB... 7.4 in Young America... 7 in Defiance, Huntington, Monroeville, Portland, Bluffton, and Montpelier, and 6 in Marion, Columbus Grove, Fort Wayne, Hartford City, Monticello, Van Wert, Wabash, Wauseon, and Columbia City.